

## Learning change-of-state verbs: Sentence type does not affect lexicalization biases

Learning the meaning of verbs is based on principally ambiguous input, namely, selecting a target verb meaning from multi-interpretable scenes. This study investigates the role of syntactic cues (Gleitman 1990; Naigles 1996) in the development of lexicalization patterns of change-of-state scenes in Dutch preschoolers. We compared transitive and intransitive sentences using a novel-verb paradigm using two different tasks. If sentence frame plays a role in determining manner/result readings (Wagner 2010), it was expected that an intransitive condition would trigger mostly manner readings and a transitive condition result readings.

Experiment 1: Dutch children (N=39,  $M_{age}=3;11$ ) and adults (N=8) participated in a two-alternative forced-choice task modelled after Wagner (2010). During training participants watched animations of novel events where an agent manipulated an object in a certain manner causing a change-of-state in that object, while they heard a novel verb presented in an intransitive or transitive sentence frame (between-subjects design). At test participants saw two screens--one showing a similar manner as the sample, the other showing a similar result--and had to choose which one depicted the novel verb (Figure 1). Two-way repeated-measures ANOVAs showed that the adults ( $F(1,10)=5.07, p<.05$ ) were strongly result-biased. None of the participants were manner biased. Logistic mixed-models revealed no effect of sentence frame: the result bias occurred equally often in both conditions (Figure 2). In contrast, the children had no such bias.

Experiment 2: Dutch children (N=41,  $M_{age} 3;2$ ) and adults (N=39) watched animations of novel events in which an agent manipulated an object in different manners causing a full result or no result at all. Extending Skordos and Papafragou's (2014) match-to-sample paradigm to change-of-state events, participants judged whether or not novel scenes matched the given sample (Figure 3). Using a between-subjects design, participants heard one of four descriptions: No-Label ("*look what is happening*"), Lexical-Label ("*this is blorking*"), Intransitive-Frame ("*the monster is blorking*") or Transitive-Frame ("*the monster is blorking the vase*"). They judged whether or not the target was also an instance of blorking. We scored how frequently participants judged targets to share the same manner or result features as the sample. A two-way ANOVA on the result-bias scores revealed a significant interaction of Age by Sentence-Type ( $F(3,72)=4.35, p=.007$ ). Pairwise t-tests showed that adults' interpretations shifted with sentence type (p-values <.05 or lower): no bias for No-Label condition, manner bias for Lexical-Label, result bias for Intransitive-Frame and an even stronger result bias for Transitive-Frame. Children, in contrast, always interpreted blorking as a result verb, independent of labelling and frame (no significant effects in t-tests).

In both experiments there was no effect of sentence frame. Transitivity did not play a role: both transitive and intransitive frames triggered a result interpretation in Experiment 2 and also in Experiment 1 for the adults. The responses of the children who participated in Experiment 1 need to be further examined; the type of task might not have been suitable for young children. We conclude, *contra* Wagner (2010), that syntactic bootstrapping does not affect lexicalization inferences about the result/manner dimension of novel verbs. Transitivity reveals number of participants in events (Fisher et al. 2010), but offers no cues for manner versus result meanings. Children's result bias in Experiment 2 suggests that learners' intrinsic goal orientation (Carpenter et al., 2005; Gergely et al., 2002) may bias them to result readings for novel verbs, representing a multi-interpretable scene in terms of event outcome, not manners of action.

### Selected references

- Skordos, D., & Papafragou, A. (2014). Lexical, syntactic, and semantic-geometric factors in the acquisition of motion predicates. *Developmental Psychology*, 50(7), 1985-1998.
- Wagner, L. (2010). Inferring meaning from syntactic structures in acquisition: The case of transitivity and telicity. *Language and Cognitive Processes*, 25(10), 1354-1379.

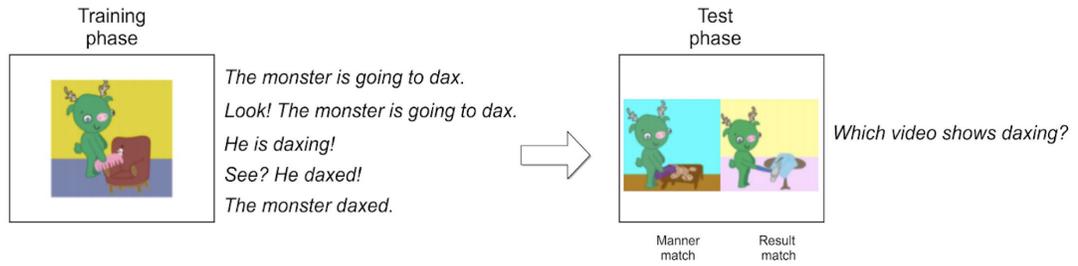


Figure 1. Trial structure for intransitive condition (Experiment 1). The training sample shows the monster combing the chair and as a result there is a hole in the chair. The left screen shows the monster combing cookies (same manner) and crushing them (different result); the right screen shows the monster hammering at a shirt (different manner), as a result of which there is a hole in the shirt (same result).

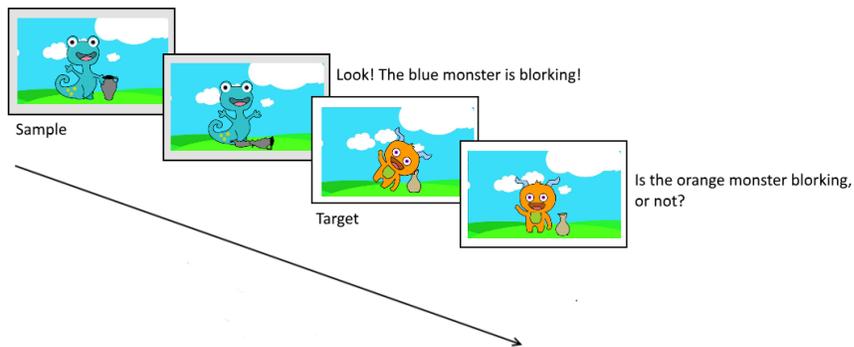


Figure 2. Trial structure for intransitive condition (Experiment 2). The sample shows a blue monster hitting vase with his arms; as a result the vase breaks completely. The target shows an orange monster hitting with his head but without any result.

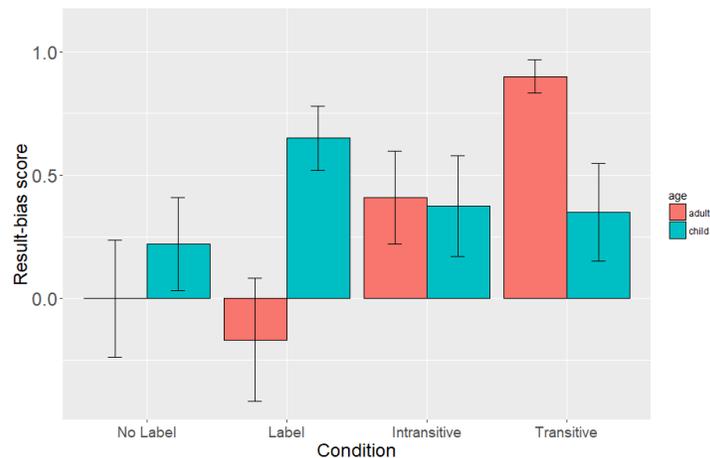


Figure 3. Result-bias score across conditions (Experiment 2). Values over 0 indicate a preference for accepting same-result targets as matches of the sample, while values under 0 indicate a preference for accepting same-manner targets.